HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Ashland/Northern States Power Lakefront
EPA ID No. WISFN0507952

Contact Persons

Site Investigation:
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Wisconsin Dept. of Natural Resources

Documentation Record:
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Pathways, Components, or Threats Not Scored

The ground water migration pathway has not been scored due to a lack of actual contamination targets or nearby potential targets which results in a relatively low pathway score. Although release to ground water has been documented, the resulting ground water pathway score would probably not contribute significantly to the overall site score; therefore the ground water pathway was not scored as part of the documentation record.

The soil exposure pathway has not been scored due to a lack of sampling of nearby residential soils. Thus, due to the limited sampling data available, the soil exposure pathway was not scored as part of the documentation record.

The air migration pathway has not been evaluated because there are no data to document observed releases to air from the sources. Due to the limited data available, the air migration pathway was not scored as part of the documentation record.

HRS DOCUMENTATION RECORD

Name of Site: Ashland/Northern States Power Lakefront

EPA Region: 5 Date Prepared: October 30, 2000

Street Address of Site: 300 St. Claire Street

City, County, State: Ashland, Ashland County, Wisconsin

General Location in the State: Northern Wisconsin

Topographic Map: Ashland, West, Wisconsin. USGS. Photo revised 1975.

Latitude: 46° 35' 45".5" North Longitude: 90° 53' 00" West

(City of Ashland Former Sewage Disposal Plant on Chequamegon Bay)

Refs: 3 and 4; Figure 1 of documentation record

Scores

Air Pathway	0.00
Ground Water Pathway	0.00
Soil Exposure Pathway	0.00
Surface Water Pathway	100
HRS SITE SCORE	50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S		S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)			
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100		10,000
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)			
2c.	Surface Water Migration Pathway Score (S_{sw} Enter the larger of lines 2a and 2b as the pathway score.	100		10,000
3.	Soil Exposure Pathway Score (S_s (from Table 5-1, line 22)			
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)			
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$			10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root		50	

TABLE 4-1
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT		
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	
2b. Runoff	25	
2c. Distance to Surface Water	25	
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	
3. Potential to Release by Flood		
3a. Containment (Flood)	10	
3b. Flood Frequency	50	
3c. Potential to Release by Flood (lines 3a x 3b)	500	
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	a	10,000
7. Hazardous Waste Quantity	a	100
8. Waste Characteristics	100	32
Targets		
9. Nearest Intake	50	0.0002
10. Population		
10a. Level I Concentrations	b	0
10b. Level II Concentrations	b	0
10c. Potential Contamination	b	0.005
10d. Population (lines 10a + 10b + 10c)	b	0.005
11. Resources	5	5

12. Targets (lines 9 + 10d + 11)	b	5.0052
Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT (Concluded)		
Drinking Water Threat Score		
13. Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100)	100	1.067
HUMAN FOOD CHAIN THREAT		
Likelihood of Release		
14. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	a	5.00E+8
16. Hazardous Waste Quantity	a	100
17. Waste Characteristics	1,000	320
Targets		
18. Food Chain Individual	50	45
19. Population		
19a. Level I Concentrations	b	
19b. Level II Concentrations	b	0.03
19c. Potential Human Food Chain Contamination	b	
19d. Population (lines 19a + 19b + 19c)	b	0.03
20. Targets (lines 18 + 19d)	b	45.03
Human Food Chain Threat Score		
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100	96.06

Factor Categories and Factors	Maximum Value	Value Assigned
ENVIRONMENTAL THREAT		
Likelihood of Release		
22. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/ Bioaccumulation	a	5.00 E+8
24. Hazardous Waste Quantity	a	100
25. Waste Characteristics	1,000	320
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	b	0
26b. Level II Concentrations	b	50
26c. Potential Contamination	b	0
26d. Sensitive Environments (lines 26a + 26b + 26c)	b	50
27. Targets (value from 26d)	b	50
Environmental Threat Score		
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60	60
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED		
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	100
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE		
30. Component Score (S_{of})[c], (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	100

[a]Maximum= value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, 40 CFR Part 300, Appendix A. December 14, 1990. Excerpt, 1 page.
2.	EPA. Superfund Chemical Data Matrix. June 1996.
3.	U.S. Geological Survey (USGS), 7.5 Minute Series Topographic Quadrangle Map of Ashland West, Wisconsin, Scale 1:24000, Photo revised 1975, 1 map.
4.	EPA. Latitude and Longitude Calculation Worksheet. 2 pages.
5.	Dames and Moore. Site Investigation Report. August 1995, 326 pages.
6.	Short Elliott Hendrickson, Inc. Ashland Lakefront Property Existing Conditions Report. February 1995, 312 pages.
7.	Dames and Moore. Supplemental Facility Site Investigation and Remedial Action Options Evaluation Report. March 1999, 332 pages.
8.	Photographs, Maps, and Diagrams. Ashland Lakefront Project. 16 pages.
9.	Michael Best and Friedrich, LLP. Ashland Lakefront Project, Affidavits of Tom Roy, John Selner, Gordon F. Parent, Frank Kucinski, Thomas W. Nelson, and Eugene Boyle, and Schroeder’s Articles of Incorporation. February 10, 2000. 59 pages.
10.	Wisconsin Department of Natural Resources. Superfund Pre-CERCLA Program Sampling Report: Ashland/NSP Lakefront. 7 pages.
11.	Wisconsin State Laboratory of Hygiene, Environmental Sciences Section, Sample Results for OK-002393 to OK002403. February 29,2000. 152 pages.
12.	Short Elliott Hendrickson Inc. Sediment Investigation Report, Ashland Lakefront Property, Chequamegon Bay - Ashland, Wisconsin. July 1996, 422 pages.
13.	US Department of Health and Human Services, Agency for Toxic Substances and Disease Registry. Health Consultation, Contaminated Chequamegon Bay Sediments at Kreher Park, Ashland, Ashland County, Wisconsin. October 25, 1999. 10 pages.
14.	Dames and Moore. Supplemental Site Investigation for the Northern States Power Facility, Ashland, Wisconsin. October 22, 1999, 225 pages.
15.	Wisconsin State Laboratory of Hygiene. Volatile Organic Compounds Sample Results for OK-002392 to OK002393. February 29,2000, 317 pages.

16. Short Elliott Hendrickson Inc. Ashland Lakefront Property - Contaminated Sediments, Ecological Risk Assessment, Ashland, Wisconsin. October 1998, 254 pages.

17. Dames and Moore. Remedial Action Options Feasibility Study - Final Report for the Ashland Lakefront Site, Prepared for Northern States Power, Ashland, Wisconsin. March 1, 1999, 128 pages.

18. US Geological Survey. Ashland, Wisconsin, 1953., Scale 1:250,000, 1 map (For Surface Water Target Distance Limit).

19. Web Sites: United States Environmental Protection Agency (Accessed June 6, 2000)
http://www.epa.gov/grtlakes/fund/projects/99projects/ashland.html
Wisconsin Department of Natural Resources (Accessed June 7,2000)
http://www.dnr.state.wi.us/org/land/er/factsheets/birds/Comtern.html

http://www.dnr.state.wi.us/org/land/er/factsheets/birds/images/map12.gif

20. Northern States Power. Ashland Lakefront Project, USEPA Briefing. February 1, 2000, 23 pages.

21. Dobbins, William, Wisconsin Department of Natural Resources. Memorandum to James Dunn, Subject: Ashland Water Supply. August 4, 2000, 3 pages.

22. State of Wisconsin. Annual Report of the Ashland Light, Power & Street Railway Co., for the years ending 1909 to 1915; 1917 to 1922; 1938, 1939, 1941, and 1944, 128 pages.

23. Randal V. Falstad and James R. Dunn. Interview with Gordon Parent, October 19, 1998, 2 pages.

24. Greeley and Hansen Engineers. Record Drawings: Junction Chamber, Claire Street and Third Avenue East (March 1951); and Waste Water Treatment Plant Plans (1958), 4 pages.

25. Strand, Fred, Wisconsin Department of Natural Resources. Memorandum to Jamie Dunn: Common Terns. July 27, 2000, 1 page.

26. Schram, Stephen, Wisconsin Department of Natural Resources. Memorandum to Jamie Dunn: Fishing on Chequamegon Bay. July 27, 2000, 1 page.

27. Wisconsin Department of Natural Resources. Superfund Pre-CERCLA Program Scope of Work/Sampling Plant: Ashland/NSP Lakefront. 13 pages.

28. Wisconsin Department of Natural Resources. Memo: Detection Limits. July 10, 2000, 3 pages.

29. Khazae, Charlene. Chemist. Wisconsin Department of Natural Resources. Letter to Ms. Griffin: Ashland /NSP Lakefront Site Data Package. May 2, 2000, 48 pages.

30. Wisconsin Department of Natural Resources. The Endangered and Threatened Species of Wisconsin, Status, Distribution, and Life History, Publication No. ER-091. June, 1997, 7 pages.

Site Overview

The Ashland/Northern States Power Lakefront site is located in Ashland, Wisconsin. The site is bordered by US Highway 2 to the south, Prentice Avenue to the east, Ellis Avenue to the west, and Chequamegon Bay to the north. The properties on which contamination is located encompass approximately 12 acres and from south to north include Northern States Power Company (NSP) (formerly the location of a manufactured gas plant), Wisconsin Central Limited Railroad corridor, City of Ashland's old waste water treatment plant/Kreher Park, and contaminated sediments in Chequamegon Bay. The site encompasses contamination in two sources, sediments in Chequamegon Bay, and areas where contamination has migrated as a result of activities conducted by the former manufactured gas plant that operated on the NSP property.

The lakefront portion of the site has been the location of industrial activities over the past century and a half and currently consists of a land-filled area in Kreher Park. A series of sawmills operated on the lakefront from the early 1880's through 1931. The City-owned parcels of the lakefront were created anthropogenically in the late 1800s and early 1900s by the placement of fill materials into Chequamegon Bay. The fill material identified to date includes wood wastes, clay, silt, peat, sand. Fill soils typically consist of a surficial soil layer overlying a layer of slab wood and sawdust mixed with some soils. In the western portion, the fill material was mixed with demolition waste. The uncontrolled filling of the rest of this area occurred during and after the operation of the sawmills. This area is transected from the east to the west by a bluff facing north at the location of the pre-fill natural shoreline. Presently the Ashland lakefront is Kreher Park, a recreational park with fishing, swimming, boating, and camping amenities. The Wisconsin Central Limited Railroad bisects the Ashland Lakefront/Kreher Park area and the Northern States Power property, which is adjacent on the south of Kreher Park.

Just south of the Chequamegon Bay Lakefront/Kreher Park area is the NSP property, which was the location of a former manufactured gas plant (MGP). During the MGP operation, residual coal tar was produced as a by-product from the manufacture of coal gas and water gas. On the NSP property, a ravine extended from south to north, emptying out at the natural shoreline to the north near the railroad tracks. This ravine was open at the start-up of gas production and was filled by the early 1900s. The fill material includes cinders ash, boiler slag, demolition debris and soil. Ground water in the vicinity of the ravine is contaminated with PAHs, VOCs, and DNAPL oil, and tar. Ground water in the vicinity of the former ravine moves from south to north, towards the natural shoreline. Just north of the ravine along this natural shoreline, at the former mouth of the ravine, is a seep where water, oils, and tar seep to the land surface. Historic drawings of record note a pipe running from the MGP north with a caption, *2" to abandon tar dump.*

Contaminated sediments in Chequamegon Bay are located directly off shore of Kreher Park. Sediments in this area contain VOCs and PAHs and DNAPL oils and tars. Disturbance of these contaminated sediments releases oils and tars to the water column and surface, which causes a slick to form on the water surface.

Fishing is encouraged in Chequamegon Bay, and the Common Tern, a state endangered species, nests in Chequamegon Bay.

Since 1980, the City of Ashland and the Wisconsin Department of Natural Resources have investigated contamination on the lakefront property and subsequently (1995) on the NSP property. The landfilled area at the Ashland Lakefront/Kreher Park and the former ravine have been identified as sources contributing to the contamination in Chequamegon Bay.

SITE LOCATION MAP

A copy of the site location map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of source: Former Ravine Area Number of source: 1

Source Type: Landfill

Description and Location of Source with reference to a map of the site: (Figure 2 of HRS documentation record.

A manufactured gas plant (MGP) facility formerly owned by the Ashland Light, Power, and Street Railway Company, the Lake Superior District Light Company and a succession of other companies operated on the southwest corner of 3rd Avenue and Prentice Street near the southern end of the ravine area from the late 1800's to approximately 1947 in Ashland, Wisconsin (Ref. 5, pages ES-1, 1; Ref. 5, Figure 1-3; Ref. 22, page 2). The MGP discontinued the manufacture of natural gas from coal at this time, and has since been converted to an office and maintenance facility (Ref. 5, page 1) The MGP has changed ownership over time and Northern States Power Plant (NSP) presently operates a service, storage and maintenance facility at this location (Ref. 5, page 1). The NSP property encompasses approximately 2 acres. Throughout its operation, the MGP produced gas utilizing different processes, equipment, and feedstock. The plant reportedly produced gas by coal carbonization until approximately 1920, when the plant was reportedly converted to a carburetted water gas process (Ref. 5, pages ES-1, 1).

During the MGP operation, residual coal tar was produced as a by-product from the manufacture of coal gas and water gas (Ref. 5, page 1). These wastes included coal tars and oils. Facility records, where available, as well as a study of MGP facilities nationwide indicate that coal tar or oils were not segregated for recovery from the wastewater or other waste streams until 1939. From 1939 to 1947, some tar was collected for sale (Ref. 5, page 1; Ref. 22, pages 1, 3 to 5, 7, 9 to 11, 13, 15 to 17, 19, 21 to 23, 25, 27 to 29, 31, 33 to 35, 37, 39 to 43, 46 to 51, 53, 56, 59 to 61, 63, 66, 68 to 70, 72, 76 to 78, 80, 83, 85 to 87, 89, 92 to 95, 97, 103 to 106, 108, 111, 113 to 115, 117, 118, 120, 121, 123, 124, 126, 127). Information on the disposition of the residual coal tar that was not sold is unavailable (Ref. 5, page 2). No record exists on the waste disposal methods used by the facility. On-site fill soils contaminated with coal tar have been found with free product DNAPL coal tar at the base of a former ravine that extends north-south across the NSP facility, indicating that some of the coal tar was disposed on site (Ref. 5, page 2; Ref. 22, pages 1, 3 to 5, 7, 9 to 11, 13, 15 to 17, 19, 21 to 23, 25, 27 to 29, 31, 33 to 35, 37, 39 to 43, 46 to 51, 53, 56, 59 to 61, 63, 66, 68 to 70, 72, 76 to 78, 80, 83, 85 to 87, 89, 92 to 95, 97, 103 to 106, 108, 111, 113 to 115, 117, 118, 120, 121, 123, 124, 126, 127). Historic drawings of record note a pipe running from the MGP north with a caption, *2" to abandoned tar dump* (Ref.8, page 15; Ref. 23, pages 1, 2).

Prior to 1909, a ravine extended through the upper bluff area in the vicinity of the NSP facility. The ravine was a natural erosional feature, which historically discharged surface water from the upper bluff area to Chequamegon Bay (Ref. 5, page 2, Figure 1-3, Figure 1-4, Figure 4-1; Ref. 8, pages 2, 3). The ravine was filled by 1923 based on review of historic Sanborn Fire Insurance maps of the

vicinity (Ref. 8 pages 2, 15, 16; Ref. 5, page ES-1; Ref. 12, page 2). The location of the ravine generally conforms to what was anticipated based on Sanborn maps of the area (Ref. 5, page 14). The former ravine was a natural feature that began at the south edge of the NSP facility near Lake Shore Drive and extends to the Wisconsin Central Limited Railroad on the north. (Ref. 5, pages 1, 2, Figure 1-2). The mouth of the ravine appears to be more narrow on the Sanborn maps (Ref. 5, page 14, 15) The fill of the ravine is estimated to be 29,400 cubic yards (Ref. 5, pages ES-1, 2, 14, 15).

A site investigation report prepared for NSP in 1995 documents contamination in the former ravine area. According to this report a total of 24 soil borings were advanced on the NSP property to define the thickness of backfill material placed in the former ravine. (Ref. 5 page 9, 13, 14). Soil boring locations were selected based on five previous soil borings (SB-1 through SB-5) advanced north of St. Claire Street on the NSP property by Cedar Corp, and three soil borings (B-1, B2/TW-13, and B-3) advanced along St. Claire Street by Short Elliot and Hendrickson (SEH). Soil borings advanced by Dames and Moore include B-1 through B-3, B-6 through B-22, and MW-1 through MW-4 as shown on Figure 4-1; see also Figure 4-3 (Ref. 5, pages 13, 14). A 1999 Supplemental investigation report prepared for NSP documents free product DNAPL thickness in monitoring wells within the ravine ranging from inches to over 20 feet in TW-13, MW-9, MW-13A, MW-13B, and MW-15 (Ref. 14, page 8, Table 3, and Figure 2).

Soil and ground water samples collected from the former ravine show contamination of volatile and semivolatile organic compounds consistent with coal tar wastes (Ref. 5, pages 5 through 23).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Background Concentrations: Sample B2

Soil sample B2 collected in the northeastern area of the former ravine area was selected as a background sample. The organic hazardous substances detected in Source 1 are not naturally occurring or ubiquitous substances and Sample B2 was selected to document background levels for contamination in Source 1 for HRS scoring. Sample B2 is a soil boring sample collected at a depth of 0 to 17 feet. All substances used to document Source 1 are above the background detection limit or significantly above the level in Sample B2 (Ref. 5, Table 4-1, Appendix A pages 4, 5, 51, Appendix C pages 5, 6, 18, 23, 30,31).

Sample ID: B2
Sample Type: Soil
Date :4/27/95

Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
Acenaphthylene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Anthracene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Benzene	ND	2.5 ug/kg	Ref. 5, Appx. C, page 30

Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
Benzo(a)anthracene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Benzo (a) pyrene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Benzo(b)fluoranthene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Benzo(k)fluoranthene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Benzo(g,h,i)perylene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
n-Butylbenzene	ND	5.0 ug/kg	Ref. 5, Appx. C, page 30
Chrysene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Ethylbenzene	ND	2.5 ug/kg	Ref. 5, Appx. C, page 30
Fluoranthene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Fluorene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Indeno (1,2,3-cd)pyrene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
2-Methylnaphthalene	ND	120 ug/kg	Ref. 5, Appx. C, page 5
Naphthalene	ND	10 ug/kg	Ref. 5, Appx. C, page 30
Phenanthrene	ND	120 ug/kg	Ref. 5, Appx. C, page 6
Pyrene	ND	120 ug/kg	Ref. 5, Appx. C, page 6
1,2,4-Trimethylbenzene	ND	5 ug/kg	Ref. 5, Appx. C, page 30
1,3,5 Trimethylbenzene	ND	5 ug/kg	Ref. 5, Appx. C, page 30
Toluene	2.5 ug/kg	4 ug/kg	Ref. 5, Appx. C, page 30
Xylenes	ND	10 ug/kg	Ref. 5, Appx. C, page 31

ND = Non detect

- Source Samples:

Soil Samples B-6 (depth of 0 to 27 feet), B-9 (depth of 0 to 23 feet), B-11 (depth of 0 to 15 feet), and B-13 (depth of 0 to 21 feet) are used to document contamination in the Former Ravine Area (Ref. 5, pages 14, Appendix A pages 8, 9, 14, 15, 17, 18, 20, 21, 53, 56, 58, 60). These samples were collected in April and June of 1995. Additional soil boring samples collected in the Fall of 1998 in the locations of MW-9, MW-12, MW-15, B-23, B-24, B-25, B-26, B-27, B-28, B-29,

B-30, B-31, and B-32 in the Former Ravine Area also document contamination in this source (Ref. 7 pages 3-1, 3-2, Tables 3-4A and 3-4B, and Figure 3-1).

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
B-11	soil	June 1995	Acenaphthylene	1300 ug/kg	1300 ug/kg	Ref. 5, Table 4-2 & Appendix C, pg. 11, 12, SI
B-9 B-11	soil	June 1995	Anthracene	360 1300 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5, Table 4-2 & Appendix C pg. 9, 10, 11, 12 of SI
B-6 B-11 B-13	soil	April 1995	Benzene	4.4 ug/kg 4.3 ug/kg 16 ug/kg	2.5 ug/kg 2.6 ug/kg 2.5 ug/kg	Ref. Table 4-1; Appendix C pg. 34, 36, 38
B-9 B-11	soil	June 1995	Benzo(a)anthracene	2100 4700 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C pg.9, 11
B-9 B-11	soil	June 1995	Benzo(a)pyrene	2600 5300 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-9 B-11	soil	June 1995	Benzo(b)fluoranthene	2800 4100 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-9 B-11	soil	June 1995	Benzo(k)fluorathene	280 1500 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-9 B-11	soil	June 1995	Benzo(g,h,i)perylene	1400 2900 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
B-13	soil	April 1995	n-Butylbenzene	9.4 ug/kg	5.0 ug/kg	Ref. 5 Table 4-1, Appendix C, pg, 38
B-9 B-11	soil	June 1995	Chrysene	2300 5600 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-13	soil	April 1995	Ethylbenzene	14 ug/kg	2.5 ug/kg	Ref. 5 Table 4-1, Appendix C, pg. 38
B-9 B-11	soil	June 1995	Fluoranthene	2100 6000 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-9	soil	June 1995	Fluorene	130 ug/kg	120 ug/kg	Ref. 5 Appendix C, pg. 9
B-9 B-11	soil	June 1995	Indeno (1,2, 3-cd)pyrene	1100 2400 ug/kg	120 ug/kg 1300 ug/kg	Ref. 5 Appendix C, pg. 9, 11
B-13	soil	June 1995	2-Methylnaphthalene	1400 ug/kg	130 ug/kg	Ref. 5 Appendix C, pg. 13
B-13	soil	June 1995	Naphthalene	470 ug/kg	130 ug/kg	Ref. 5 Appendix C, pg. 13
B-11 B-13	soil	April 1995	Naphthalene	16 ug/kg 140 ug/kg	10 ug/kg 10 ug/kg	Ref. 5 Appendix C, pg. 34, 38
B-9 B-11 B-13	soil	June 1995	Phenanthrene	650 3700 170 ug/kg	120 ug/kg 1300 ug/kg 130 ug/kg	Ref. 5 Appendix C, pg. 10, 12, 14

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
B-9 B-11 B-13	soil	June 1995	Pyrene	5000 12000 420 ug/kg	120 ug/kg 1300 ug/kg 130 ug/kg	Ref. 5 Appendix C, pg. 10, 12, 14
B-13	soil	April 1995	1,2,4-Trimethylbenzene	9.7 ug/kg	5.0 ug/kg	Ref. 5 Table 4-1,Appendix C, pg. 38
B-13	soil	April 1995	1,3,5 Trimethylbenzene	7.9 ug/kg	5.0 ug/kg	Ref. 5 Table 4-1, Appendix C, pg. 38
B-6	soil	April 1995	Toluene	12 ug/kg	2.5 ug/kg	Ref. 5 Tab1e 4-1,Appendix C, pg. 36
B-13	soil	April 1995	Xylenes	46 ug/kg	10 ug/kg	Ref. 5 Table 4-1,Appendix C, pg. 38, 39

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Release via overland migration and/or flood:

Surface water flows either to the City of Ashland storm sewer system or discharges to Chequamegon Bay. Historical site maps reveal an open sewer extending across the west side of the Ashland Lakefront property was present until 1951 (Ref. 24, page 3). Drainage from the NSP property, which includes the area of Source 1, is to the north (Ref. 5, page 7). To the northwest, the site slopes steeply to the Wisconsin Central Limited Railroad property, and then to the City of Ashland's Kreher Park, beyond which is Chequamegon Bay (Ref. 7, page 2-1; Ref. 8 pages 5, 6, 7). The area of the former ravine just south of St. Claire Street is covered by a paved parking lot, vehicle storage areas and an office building. Additional paved parking and a residential area are located at the southern portion of the former ravine near Lakeshore Drive. The northern portion of the former ravine is a fenced, outdoor, gravel storage area; there is no indication of containment features such as a maintained engineered cover, functioning run-on control system or a runoff management system in this area (Ref. 5, page 7 and Figure 4-1.) The pavement, vehicle storage areas, and the office building do not provide the entire former ravine with a maintained engineer cover or functioning run-on and run-off control. Because the entire former ravine does not have functioning run-on control and runoff management system, a containment factor value of 10 is assigned to Source 1 (Ref. 1, HRS Table 4-2; Ref. 5, pages 5 to 23, 58 to 60, and Figure 4-1. Ref. 7, page 2) Contamination in Source 1 extends below the water table (Ref. 5, pg. 14, Figures 4-3, 4-4, and 4-5). Relatively high concentrations of VOC, SVOC, and PAH contaminants are present in surface and subsurface soils as well as ground water collected from the monitoring wells on Source 1 (Ref. 5, pages 5 to 23, 58 to 60).

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Description

Insufficient information is available to determine the hazardous constituent quantity.

Sum (pounds):

Hazardous Constituent Quantity Assigned Value:

2.4.2.1.2. Hazardous Wastestream Quantity

Description

Insufficient information is available to determine the hazardous waste stream.

Sum (pounds):
Sum of Wastestream Quantity/5,000 (Table 2-5):
Hazardous Wastestream Quantity Assigned Value:

2.4.2.1.3. Volume

Description

Estimates for the fill in the ravine were prepared for the Northern States Power Company by Dames and Moore. The fill in the ravine was estimated as 29,400 cubic yards (yd^3) (Ref. 5, pages ES-1, 4, 14, 15)

Source Type	Description (# drums or dimensions)	Units (yd^3/gal)	References
Landfill	29,400	yd^3	Ref. 5, page ES-1, 2, 14, 15

Sum (yd^3/gal): 29,400 yd^3
Equation for Assigning Value (HRS Table 2-5):29,400 yd^3 ÷ 2,500 = 11.76
Volume Assigned Value: 11.76

2.4.2.1.4. Area

Not Evaluated.

SOURCE 1 MAP

A copy of the Source 1 map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

Name of source: Ashland Lakefront/Kreher Park Area Number of source: 2

Source Type: Landfill

Description and Location of Source (with reference to a map of the site): Ashland Lakefront Property/Kreher Park Area (Figure 3 of documentation record).

Source 2 is approximately 10 acres in size and is currently owned by the City of Ashland (Ref. 6, page 2). It is bordered by Prentice Avenue to the east, Ellis Avenue to the west, Chequamegon Bay to the North and the Wisconsin Central railroad to the south. The former City of Ashland Waste Water Treatment Plant (WWTP) facility is located on the northeast corner of this source (Ref. 6, pages 1, 2, 3, Figure 2).

Source 2 has been the location of industrial activities over the past century and a half and currently is the location of Kreher Park, a recreational park. A series of sawmills operated in this area from the early 1880's through 1931 (Ref. 6, page 16; Ref. 16, page 4; Ref. 17, page ES-1). These facilities generated wood wastes fill material. The City-owned parcels of the lakefront were created anthropogenically in the late 1800s and early 1900s by the placement of fill materials into Chequamegon Bay (Ref. 6, page 4; Ref. 16, page 4). The fill material identified to date includes wood wastes, clay, silt, peat, and sand. Fill soils typically consist of a surficial soil layer overlying a layer of slab wood and sawdust mixed with some soils (Ref. 6, page 4). In the western portion of the Ashland Lakefront, the City operated this area as a waste disposal facility. Uncontrolled filling of the rest of this area occurred during and after the operation of the sawmills (Ref. 17, page 2-4). This area is transected from the east to the west by a bluff facing north at the location of the pre-fill natural shoreline (Ref. 6, pages 3, 4, 16). One block south of the Ashland Lakefront is the NSP Company, the location of a former MGP operation (Ref. 6, pages 3, 16, Figure 2; Ref. 5, Figure 1-2).

During the MGP operation, residual coal tar was produced as a by-product from the manufacture of coal gas and water gas (Ref. 5, page 1). Facility records, where available, indicate that coal tar was not segregated for recovery from the wastewater or other streams until 1939. From 1939 to 1947, some tar was collected for sale (Ref. 5, page 1; Ref. 22, pages 1, 3 to 5, 7, 9 to 11, 13, 15 to 17, 19, 21 to 23, 25, 27 to 29, 31, 33 to 35, 37, 39 to 43, 46 to 51, 53, 56, 59 to 61, 63, 66, 68 to 70, 72, 76 to 78, 80, 83, 85 to 87, 89, 92 to 95, 97, 103 to 106, 108, 111, 113 to 115, 117, 118, 120, 121, 123, 124, 126, 127). Information on the disposition of the residual coal tar that was not sold is unavailable (Ref. 5, page 2). No record exists on the waste disposal methods used by the facility. On-site fill soils contaminated with coal tar have been found with free product DNAPL coal tar at the base of a former ravine that extends north-south across the NSP facility, indicating that some of the coal tar was disposed on site (Ref. 5, pages 1, 2). Historic drawings of record note a pipe running from the MGP north with a caption, *2" to abandoned tar dump* (Ref. 23, pages 1, 2). Historic drawings of record for the design of the waste water treatment plant denote a "waste tar dump" located south of the waste water treatment plant (Ref. 6, page 7, 8, 9; Ref. 8, pages 1 through 5, 8, 9, 15, 16; Ref. 9, pages 11, 12; Ref. 24, page 4). Contamination in soil and groundwater in both the Ashland Lakefront and the former ravine indicate that the former ravine may be a conduit for contamination onto the

Ashland Lakefront/Kreher Park (Ref. 5, page ES-1; Figures 1-3, 4-1; Ref. 6, page 18).

Eyewitness accounts indicate that a pipe for the transport of tar ran from the MGP to the southern portion of Kreher Park in the general location of the seep (Ref. 23, pages 1, 2). Eyewitness accounts also indicate that open tar creosote pits may have been located south of the present WWTP and were used to treat lumber on the Schroeder property, a former saw mill which operated on the Ashland Lakefront (Ref. 9, pages 3, 6, 9, 11, 12, 17, 19; Ref. 20, pages 6, 20).

In 1989 the City of Ashland authorized Northern Environmental to perform an investigation on the Kreher Park area for the possible expansion of the existing wastewater treatment facility, which at the time operated on the north side of the park, discharging to the bay (Ref. 5, page 2). The discovery of contamination from what was believed to be creosote wastes in the subsoils and ground water at Kreher Park prompted the City to abandon the project, and construct a new treatment facility at another location. Subsequently, the WDNR authorized Short Elliott and Hendrickson Inc. (SEH) under the Wisconsin Environmental Repair Fund to perform an assessment of the contamination at the Kreher Park area (Ref. 5, page 2). SEH performed an historical review, excavated a series of test pits at the Ashland Lakefront property and installed and sampled ground water monitoring wells at Kreher Park and at the NSP site. Soil borings and contaminated ground water in this area have shown elevated levels of hazardous substances. (Ref. 5, page 2; Ref. 6 page 1, Tables 2, 3, 4, 5, 6).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Background Concentrations:

A soil sample from TP-2 (test pit number 2) at a depth of 2 to 4 feet is used as a background sample for the Ashland Lakefront/Kreher Park area. This sample is from fill soil and is located in the center of Source 2; because the organic hazardous substances detected in Source 2 are not naturally occurring or ubiquitous substances, Sample TP-2 was selected to document background levels for contamination in Source 2 for HRS scoring. All substances used to document Source 2 are above the background detection limit or significantly above the level in sample TP-2 (Ref. 6, Tables 3 & 4, Appendix F, pages 42 & 43; Figure 3 of HRS documentation record).

Sample Id: TP-2
Sample Type: Fill Soil
Depth: 2 - 4 feet
Date: 9/7/94

Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
Acenaphthene	ND	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43;
Acenaphthylene	ND	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43

Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
Anthracene	0.520 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Benzene	ND	0.002 ug/g	Ref. 6, Tables 3 & 4, Appendix F pg. 42
Benzo(a)anthracene	2.78 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Benzo(a)pyrene	2.03 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Benzo(b)fluoranthene	3.14 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Benzo(k)fluoranthene	0.972 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Benzo(g,h,i)-Perylene	2.44 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
n-Butylbenzene	ND	0.012 ug.g	Ref. 6, Tables 3 & 4, Appendix F pg. 42
sec-Butylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 42
Chrysene	1.92 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Dibenzo(a,h)-Anthracene	0.513 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 44
Ethylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
Fluoranthene	5.70 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 44
Fluorene	0.187 ug/g J	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 44
Indeno(1,2,3-cd)Pyrene	2.21 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 44
Isopropylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg. 43
p-Isopropyltoluene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
2-Methynaphthalene	ND	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.44

Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
Phenanthrene	2.98 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.44
n-Propylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
Pyrene	3.42 ug/g	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.44
Naphthalene	0.169 ug/g J	0.40 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
Toluene	0.029 ug/g	0.025 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
1,2,4-Trimethylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
1,3,5-Trimethylbenzene	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43
Xylenes	ND	0.012 ug/g	Ref. 6, Tables 3 & 4, Appendix F, pg.43

ND Non detect

- Source Samples:

Nine test pit samples were excavated on September 9, 1994, by Short Elliott Hendrickson Inc. from the Ashland Lakefront/Kreher Park area (Ref. 6, pages 1, 8). Analytical data from TP-1, and TP-3 to TP-9 are used to characterize contamination in Source 2 (Ref. 6, Table 3, Appendix F). These samples consisted of fill soil, wood waste, and refuse (Ref 6, Table 3). Background fill soil samples are compared to background source soil samples. Wood waste and refuse samples also characterize Source 2 but these samples need not be compared to background soil samples for source characterization because these are source waste samples. Additional sampling for the characterization of Source 2 is also available from the analytical data of test wells and monitoring wells TW-1 through TW-13 and MW-1 through MW-3 (Ref. 6 Tables 2, 3, 4, 5, 6).

Sample ID	Sample Type	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
TP-1 TP-5 TP-9	wood waste	Acenaphthene	6.64 ug/g 782 ug/g 4.91 ug/g	5.6 ug/g 53 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 52, 60
TP-4 TP-9	wood waste	Acenapthylene	1,875 ug/g 4.22 ug/g	363 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 60
TP-4 TP-5	wood waste	Anthracene	640 ug/g 324 ug/g	363 ug/g 53 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 52
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	Benzene	2.10 645 5.62 0.337 0.675 ug/g	0.070 ug/g 3.1 ug/g 0.6 ug/g 0.009 ug/g 0.008 ug/g	Ref. 6, Table 3 & Appendix F, page 38, 50, 51, 57, 59
TP-5	wood waste	Benzo(a)anthracene	204 ug/g	53 ug/g	Ref. 6, Table 3 & Appendix F, page 52
TP-1 TP-3 TP-5 TP-7 TP-9	wood waste	Benzo(a)pyrene	6.66 ug/g 20.9 ug/g 206 ug/g 14.7 ug/g 12.5 ug/g	5.6 ug/g 7.9 ug/g 53 ug/g 8.7 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 48, 52, 56, 60
TP-3 TP-5 TP-7 TP-9	wood waste	Benzo(b)fluoranthene	11.3 ug/g 118 ug/g 1O ug/g 11.2 ug/g	7.9 ug/g 53 ug/g 8.7 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 48, 52, 56, 60
TP-5	wood waste	Benzo(k)fluoranthene	74 ug/g	53 ug/g	Ref. 6, Table 3 & Appendix F, page 52
TP-3 TP-5 TP-7 TP-9	wood waste	Benzo(g,h,i)perylene	24.7 ug/g 79.0 ug/g 26.3 ug/g 25.1 ug/g	7.9 ug/g 53 ug/g 8.7 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 48, 52, 56, 60
TP-5 TP-9	wood waste	Chrysene	53 ug/g 6.69 ug/g	208 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 52, 60
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	Ethylbenzene	0.469 2973 51.1 0.149 0.323 ug/g	0.348 ug/g 16 ug/g 2.8 ug/g 0.149 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 49, 52, 58, 60

Sample ID	Sample Type	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
TP-4 TP-5	wood waste	Fluoranthene	605 ug/g 366 ug/g	363 ug/g 53 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 52
TP-4 TP-5	wood waste	Fluorene	1,003 ug/g 279 ug/g	363 ug/g 53 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 52
TP–3 TP-5 TP-7 TP-9	wood waste	Indeno(1,2,3-cd)pyrene	19.4 ug/g 65.6 ug/g 22 ug/g 17.4 ug/g	7.9 ug/g 53 ug/g 8.7 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 48, 52, 56, 60
TP-1 TP-5	wood waste	2-Methylnaphthalene	6.4 ug/g 706 ug/g	5.6 ug/g 53 ug/g	Ref. 6, Table 3 & Appendix F, page 41
TP-1 TP-3 TP-4 TP-5 TP-8 TP-9	wood waste	Naphthalene	10.2 29 28469 1,077 1.57 5.26 ug/g	0.348 ug/g 0.97 ug/g 16 ug/g 53 ug/g 0.408 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 48, 49, 52, 58, 60
TP-1 TP-5	wood waste	Phenanthrene	10.1 ug/g 1,254 ug/g	5.6 ug/g 53 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 52
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	n-Propylbenzene	0.850 101 4.89 0.053 0.056 ug/g	0.348 ug/g 16 ug/g 2.8 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 49, 52, 58, 60
TP-1 TP-3 TP-5 TP-7 TP-9	wood waste	Pyrene	13.8 ug/g 10.8 ug/g 759 ug/g 14.2 ug/g 17.8 ug/g	5.6 ug/g 7.9 ug/g 53 ug/g 8.7 ug/g 2.9 ug/g	Ref. 6, Table 3 & Appendix F, page, 41, 48, 52, 56, 60
TP-4 TP-5 TP-8 TP-9	wood waste	p-Isopropyltoluene	95.1 21.3 0.238 0.104 ug/g	16 ug/g 2.8 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 52, 58, 60
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	n-Butylbenzene	3.48 648 54.9 0.058 0.415 ug/g	0.348 ug/g 16 ug/g 2.8 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 38, 50, 51, 57, 59

Sample ID	Sample Type	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
TP-4 TP-5 TP-9	wood waste	Isopropylbenzene	190 6.20 0.056 ug/g	16 ug/g 2.8 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 49, 52, 60
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	1, 2, 4-Trimethylbenzene	1.81 2994 6.15 0.042 0.282 ug/g	0.348 ug/g 16 ug/g 1.47 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 49, 52, 58, 60
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	1, 3, 5-Trimethylbenzene	1.36 742, 17.4 0.112 0.154 ug/g	0.348 ug/g 16 ug/g 2.77 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 49, 52, 58, 60
TP-1 TP-4 TP-5 TP-8 TP-9	wood waste	Xylenes	2.75 4981 68.8 0.232 0.499 ug/g	0.348 ug/g 16 ug/g 2.77 ug/g 0.042 ug/g 0.039 ug/g	Ref. 6, Table 3 & Appendix F, page 41, 49, 52, 58, 60
TP-4	wood waste	sec-Butylbenzene	2688 ug/g	16 ug/g	Ref. 6, Table 3 & Appendix F, page 50
TP-4	wood waste	Toluene	2007 ug/g	31 ug/g	Ref. 6, Table 3 & Appendix F, page 49
TP-6	Clay Fill soil	Benzene	0.068 ug/g	0.001 ug/g	Ref. 6, Table 3 & Appendix F, page 54
TP-7	Fill soil/ Refuse	Benzene	1.01 ug/g	0.005 ug/g	Ref. 6, Table 3 & Appendix F, page 55
TP-7	Fill Soil/ Refuse	Naphthalene	1.23 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56
TP-7	Fill soil/ Refuse	Ethylbenzene	0.147 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56
TP-7	Fill soil/ Refuse	n-Butylbenzene	0.140 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 55
TP-7	Fill soil/ Refuse	Isopropylbenzene	0.029 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56

Sample ID	Sample Type	Hazardous Substance	Hazardous Substance Concentration	Detection Limit	Reference
TP-7	Fill soil/ Refuse	1, 2, 4-Trimethylbenzene	0.187 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56
TP-7	Fill soil/ Refuse	1, 3, 5, Trimethylbenzene	0.068 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56
TP-7	Fill soil/ Refuse	Xylenes	0.375 ug/g	0.024 ug/g	Ref. 6, Table 3 & Appendix F, page 56

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Release via overland migration and/or flood:

Surface water from this source flows either to the City of Ashland storm sewer system or discharges to Chequamegon Bay. There is no indication of a maintained engineered cover nor a functioning and maintained run-on control system and runoff management. For this reason a containment factor value of 10 is assigned to Source 2 (Ref. 6 page 3 and Figure 2; Ref. 8, page 1; HRS Table 4-2).

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Description
Insufficient information is available to determine the hazardous constituent quantity.

Sum (pounds):

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2. Hazardous Wastestream Quantity

Description

Insufficient information is available to determine the hazardous wastestream.

Sum (pounds):
Sum of Wastestream Quantity/5,000 (Table 2-5):
Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3. Volume

Description
Insufficient information is available to determine the volume.

Sum (yd^3/gal):
Equation for Assigning Value (Table 2-5):

Volume Assigned Value: NS

2.4.2.1.4. Area

Description
The extent of the fill area has not been determined. Available information documents Source 2 as approximately 10 acres and consisting of the area from Prentice Avenue to the east, Ellis Avenue to the west, Chequamegon Bay to the north and the Wisconsin Central Railroad to the south. Because this information does not delineate the extent of the filled area, the area of this source is determined to be a value greater than zero (Ref 6, pages 2, 3, 16).

Source Type	Units (ft^2)	References
Landfill	> 0 (unknown but greater than zero)	Ref. 6, pages 2, 3

Sum (ft^2): >0
Equation for Assigning Value (HRS Table 2-5): Area ÷ 3,400 =

Area Assigned Value: Unknown > 0

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Table 2-5: Unknown > 0

SOURCE 2 MAP

A copy of the Source 2 map is available at the EPA Headquarters Superfund Docket:

U.S. CERCLA Docket Office
Crystal Gateway #1, 1st Floor
1235 Jefferson Davis Highway
Arlington, VA 22202

Telephone: (703) 603-8917
E-Mail: superfund.docket@epa.gov

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway				
			Ground Water (GW) (Table 3-2)	Surface Water (SW)		Air	
				Overland/ flood (Table 4-2)	GW to SW (Table 3-2)	Gas (Table 6-3)	Particulate (Table 6-9)
1	11.76	N	NS	10	NS	NS	NS
2	> 0	N	NS	10	NS	NS	NS

NS Not scored

According to HRS Section 2.4.2.2, if any target is subject to Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because level II concentrations are documented in Chequamegon Bay, a fishery and a the habitat for a state designated endangered species, a surface water pathway hazardous waste quantity factor value of 100 is assigned (HRS Section 2.4.2.2; Table 4-23; Ref. 19 and Ref. 25; HRS documentation record Sections 4.1.2.1.1, 4.1.3.3, and 4.1.4.3).

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/flood Component

Overland runoff from the Ashland Lakefront Property/Kreher Park (Source 2) flows directly into Chequamegon Bay, which is adjacent and north of this source (Ref. 6, page 3; Ref. 8, pages 1, 8). Topography of the NSP property, the location of the former ravine area (Source 1), slopes to the north with a steep downward slope at the north property boundary that overlooks the Wisconsin Central Limited Railroad and Kreher Park (Ref. 5, pages 1, 7; Ref. 8, page 7). Runoff from the former ravine filled with waste from the NSP flows to Chequamegon Bay across Source 1. A seep at the mouth of the former ravine is located where the ravine originally discharged to Chequamegon Bay before the filling in of the ravine and the Ashland Lakefront. (Ref. 5, pages ES-1, 2, Figure 4-1; Ref. 8, pages 1, 3, 5, 7, 8). Runoff from the former ravine area also flows to the City of Ashland sewer, which discharges into Chequamegon Bay (Ref. 5, page 1; Ref. 8, page 5; Ref. 24, pages 2, 3). The probable point of entry (PPE) from both sources is along the Ashland Lakefront Property/Kreher Park directly into Chequamegon Bay (Ref. 3; Ref. 5, page ES-1; Ref. 8, page 8). Chequamegon Bay extends into Lake Superior; the target distance limit for the surface water pathway extends 15 miles into Lake Superior (Ref. 3; Ref. 8, pages 1 through 5, 8, 9, 15, 16; Ref. 18).

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

Chemical Analysis

In February 2000 the Wisconsin Department of Natural Resources collected sediment samples to document an observed release to Chequamegon Bay (Ref. 10, pages 1, 3, 7; Ref. 11, page 152; Ref 27, pages 3 to 9). Sample AS-1 is designated as a background sample. Samples AS-2, AS-3, AS-4,and AS-7 document a release of hazardous substances in Chequamegon Bay (Ref. 10, page 4). Background sample AS-1 was collected at a depth of 1.4 feet in Ellis Avenue Marina just west of the contaminated sediments in Chequamegon Bay (Ref. 4, page 4). This sample location was considered a suitable background location, representative of the contamination in Chequamegon Bay, because the location of the sample is also in a man-made portion of Chequamegon Bay as are the release sample locations. The substances found in the release samples are man-made hazardous substances and the background sample showed that the contamination in Chequamegon Bay is non-ubiquitous (Ref. 11, page 76; Ref. 15, pages 2, 3).

For the samples used to document an observed release in this HRS evaluation of the Ashland/Northern States Power Lakefront site, the “standard” detection limits for the compounds analyzed are provided by the Wisconsin Department of Natural Resources. If the laboratory diluted any sample, the detection limits will increase accordingly (Ref. 15, page 78; Ref. 28, pages 1, 2, 3). The observed release samples used to score this site have been reviewed by the Wisconsin

Department of Natural Resources which substantiate that the analytical data meet the State's QA/QC requirements and the data confirm contamination in Chequamegon Bay (Ref. 29, pages 2, 3).

Background Concentrations:

Sample ID: AS-1 Sample Medium: Silty sand Sample Location: Ellis Avenue Marina, West of Chequamegon Bay; Ashland, Wisconsin

Depth 1.4 feet
Date 2/8/2000
Reference: 10, pages 1, 4, 7

Hazardous Substance	Concentration	Detection Limit	Reference
Acenaphthene	ND	0.40 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Acenaphthylene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Anthracene	ND	0.46 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Benzo(a)anthracene	ND	0.49 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Benzo(a)pyrene	ND	0.32 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Benzo(b)fluoranthene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Benzo (g,h,i)perylene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Chrysene	ND	0.48 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Dibenzo(a,h)anthracene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Fluoranthene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Fluorene	ND	0.58 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Indeno(1,2,3 -cd)pyrene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Naphthalene	ND	0.33 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Phenanthrene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Pyrene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
2,6-Dimethylnaphthalene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
2-Ethylnaphthalene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
1-Methylnaphthalene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
2-Methylnaphthalene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
1-Methylphenanthrene	ND	0.67 ug/g	Ref. 11, pg. 76, 78; Ref. 28, pg. 3
Ethylbenzene	ND	0.026 ug/g	Ref. 15, pg. 3, 4, 7, 8; Ref. 28, pg. 2
n-Hexane	ND	0.064 ug/g	Ref. 15, pg. 3, 4, 7, 8; Ref. 28, pg. 2
Isopropylbenzene	ND	0.019 ug/g	Ref. 15, pg. 3, 4, 7, 8; Ref. 28, pg. 2
p-Isopropyltoluene	ND	0.019 ug/g	Ref. 15, pg. 3, 4, 7, 8; Ref. 28, pg. 2
1,2,4-Trimethylbenzene	ND	0.019 ug/g	Ref. 15, pg. 3, 4, 7, 8;Ref. 28, pg. 2
1,3,5-Trimethylbenzene	ND	0.019 ug/g	Ref. 15, pg. 3, 4, 7, 8;Ref. 28, pg. 2
m/p-Xylene	ND	0.045 ug/g	Ref. 15, pg. 3, 4, 7, 8;Ref. 28, pg. 2

Notes:

ND Non detect
ug/g micro gram per gram

- Contaminated Samples:

Sample ID:AS-2 Sample Medium: Wood waste/sand Sample Location: Chequamegon Bay

Distance from PPE: 168.75 feet
Depth 2.8 feet
Date 2/08/2000
Reference: 10, pages 1, 4, 7

Hazardous Substance	Concentration	Detection Limit	Reference
Acenaphthene	60 ug/g	4.0 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Anthracene	22 ug/g	4.6 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Benzo(a)anthracene	11 ug/g	4.9 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Benzo(a)pyrene	8.8 ug/g	3.2 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Chrysene	12 ug/g	4.8 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Fluoranthene	23 ug/g	6.7 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Fluorene	23 ug/g	5.8 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Naphthalene	150 ug/g	13.2 ug/g	Ref. 11, pg. 7, 22; Ref. 28, pg. 3
Phenanthrene	75 ug/g	6.7 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
Pyrene	36 ug/g	6.7 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
2,6-Dimethylnaphthalene	29 ug/g	6.7 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
2-Ethylnaphthalene	34 ug/g	6.7 ug/g	Ref. 11, pg. 7, 9; Ref. 28, pg. 3
1-Methylnaphthalene	70 ug/g	26.8 ug/g	Ref. 11, pg. 7, 22; Ref. 28, pg. 3
2-Methylnaphthalene	110 ug/g	26.8 ug/g	Ref. 11, pg. 7, 22; Ref. 28, pg. 3
Ethylbenzene	6.1 ug/g	0.26 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2
N-Hexane	4.0 ug/g	0.65 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2
Isopropylbenzene	0.55 ug/g	0.19 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2
p-Isopropyltoluene	0.68 ug/g	0.19 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2
1,2,4-Trimethylbenzene	2.9 ug/g	0.19 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2
1,3,5-Trimethylbenzene	0.78 ug/g	0.19 ug/g	Ref. 15, pg. 20, 25 26; Ref. 28, pg. 2
m/p-Xylene	3.3 ug/g	0.45 ug/g	Ref. 15, pg. 20, 25, 26; Ref. 28, pg. 2

Notes:

ND Non detect
ug/g micro gram per gram

Sample ID:AS-3 Sample Medium: Silty sand Sample Location: Chequamegon Bay
Distance from PPE: 168.75 feet
Depth: 1.7 feet
Date: 2/8/2000
Reference: 10, pages 1, 4, 7

Hazardous Substance	Concentration	Detection Limit	Reference
Acenaphthene	57 ug/g	4.0 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Anthracene	21 ug/g	4.6 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Benzo(a)anthracene	11 ug/g	4.9 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Benzo(a)pyrene	7.2 ug/g	3.2 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Chrysene	11 ug/g	4.8 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Fluoranthene	20 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Fluorene	29 ug/g	5.8 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Naphthalene	120 ug/g	13.2 ug/g	Ref. 11, pg. 27, 42; Ref. 28, pg. 3
Phenanthrene	63 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Pyrene	25 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
2,6-Dimethylnaphthalene	24 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
2-Ethylnaphthalene	39 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
1-Methylnaphthalene	95 ug/g	26.8 ug/g	Ref. 11, pg. 27, 42; Ref. 28, pg. 3

2-Methylnaphthalene	120 ug/g	26.8 ug/g	Ref. 11, pg. 27, 42; Ref. 28, pg. 3
1-Methylphenanthrene	8.3 ug/g	6.7 ug/g	Ref. 11, pg. 27, 29; Ref. 28, pg. 3
Ethylbenzene	97 ug/g	1.3 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2
Isopropylbenzene	7.9 ug/g	0.99 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2
p-Isopropyltoluene	5.5 ug/g	0.99 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2
1,2,4-Trimethylbenzene	34 ug/g	0.99 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2
1,3,5-Trimethylbenzene	8.7 ug/g	0.99 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2
m/p-Xylene	57 ug/g	2.3 ug/g	Ref. 15, pg. 72, 78, 79; Ref. 28, pg. 2

Notes:

ND Non detect
ug/g micro gram per gram

Sample ID: AS-4 Sample Medium: Wood/silty sand Sample Location: Chequamegon Bay

Distance from PPE: 37.5 feet
Depth: 2.7 feet
Date: 2/8/2000
Reference:10, pages 1, 4, 7

Hazardous Substance	Concentration	Detection Limit	Reference
Acenaphthene	36 ug/g	4.0 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Anthracene	15 ug/g	4.6 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Benzo(a)anthracene	8.8 ug/g	4.9 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Benzo(a)pyrene	6.6 ug/g	3.2 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Chrysene	9.2 ug/g	4.8 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Fluoranthene	16 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Fluorene	19 ug/g	5.8 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Naphthalene	66 ug/g	3.3 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Phenanthrene	48 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Pyrene	22 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
2,6-Dimethylnaphthalene	19 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
2-Ethylnaphthalene	23 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
1-Methylnaphthalene	60 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
2-Methylnaphthalene	67 ug/g	6.7 ug/g	Ref. 11, pg. 47, 49; Ref. 28, pg. 3
Ethylbenzene	9.8 ug/g	0.28 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2
Isopropylbenzene	1.5 ug/g	0.21 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2
p-Isopropyltoluene	1.8 ug/g	0.21 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2
1,2,4-Trimethylbenzene	7.6 ug/g	0.21 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2
1,3,5-Trimethylbenzene	2.1 ug/g	0.21 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2
m/p-Xylene	7.4 ug/g	0.48 ug/g	Ref. 15, pg. 128, 134, 135; Ref, 28, pg. 2

Notes:

ND Non detect
ug/g micro gram per gram

Sample ID:AS-7 Sample Medium: Wood waste/sand Sample Location: Chequamegon Bay

Distance from PPE: 225 feet
Depth: 1.7 feet
Date: 2/8/2000
Reference: 10, pages 1, 4, 7

Hazardous Substance	Concentration	Detection Limit	Reference
Acenaphthene	9.5 ug/g	1.6 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Anthracene	4.2 ug/g	1.8 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Benzo(a)anthracene	2.0 ug/g	2.0 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Benzo(a)pyrene	1.3 ug/g	1.3 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Chrysene	2.0 ug/g	1.9 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Fluoranthene	4.1 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Fluorene	5.2 ug/g	2.3 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Naphthalene	11 ug/g	1.3 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Phenanthrene	12 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Pyrene	5.4 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
2,6-Dimethylnaphthalene	4.7 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
2-Ethylnaphthalene	5.0 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
1-Methylnaphthalene	10 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
2-Methylnaphthalene	13 ug/g	2.7 ug/g	Ref. 11, pg. 81, 83; Ref. 28, pg. 3
Ethylbenzene	4.2 ug/g	0.025 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2
Isopropylbenzene	0.49 ug/g	0.019 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2
p-Isopropyltoluene	0.36 ug/g	0.019 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2
1,2,4-Trimethylbenzene	2.0 ug/g	0.019 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2
1,3,5-Trimethylbenzene	0.56 ug/g	0.019 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2
m/p-Xylene	2.8 ug/g	0.043 ug/g	Ref. 15, pg. 203, 208, 209; Ref. 28, pg. 2

Notes:
ND Non detect
ug/g micro gram per gram

Attribution

The Ashland Lakefront on Chequamegon Bay has been the location of industrial activities over the past century and a half and currently consists of Kreher Park, a recreational park owned by the City of Ashland (Ref. 5,page ES-1; Ref. 6, pages, 2, 4). The city-owned parcels of the lakefront were created anthropogenically in the late 1800s and early 1900s by the placement of fill materials into Chequamegon Bay (Ref. 6, page 4). Fill material identified to-date includes wood wastes, clay, silt, peat, sand, soil, sawdust, and slab wood (Ref 6, page 4). In the western portion of the Ashland Lakefront, the City operated this area as a waste disposal facility. Uncontrolled filling of the rest of this area occurred during and after the operation of the sawmills (Ref. 17, page 2-4). A series of sawmills operated on the Ashland Lakefront from the early 1880's through 1931 (Ref. 8, pages 3, 5; Ref. 17, pages 2-3, 2-4). Eyewitness accounts indicate that open tar creosote pits may have been located south of the present waste water treatment plant and were used to treat lumber on the property (Ref. 5, page 1; Ref. 6, page 7, 9; Ref. 23, pages 1, 2). Historic Sanborn fire insurance maps do not indicate any wood treatment structure at the property (Ref. 8, pages 3, 5, 15). Drainage from the Ashland Lakefront/Kreher Park flows to Chequamegon Bay (Ref. 6 page 3 and Figure 2; Ref. 8, page 1).

Just south of the Ashland Lakefront/Kreher Park is the Northern States Power (NSP) facility, which was the location of a manufactured gas plant (MGP) (Ref. 5, Figure 1-2; Ref. 6, pages 3, 16, Figure 2). During the operation of the MGP, residual coal tar and oils were produced as a by-product from the manufacture of coal gas and water gas (Ref. 5, page ES-1, 1). Records indicate that the residual MGP wastes were not collected from the plant start-up (1880’s) through 1938 (Ref. 22, pages 1, 3 to 5, 7, 9 to 11, 13, 15 to 17, 19, 21 to 23, 25, 27 to 29, 31, 33 to 35, 37, 39 to 43, 46 to 51, 53, 56, 59 to 61, 63, 66, 68 to 70, 72, 76 to 78, 80, 83, 85 to 87, 89, 92 to 95, 97, 103 to 106, 108, 111, 113 to 115, 117, 118, 120, 121, 123, 124, 126, 127)). These wastes included coal tars and oils. Facility records, where available, as well as a study of MGP facilities nationwide, indicate that coal tar or oils were not segregated for recovery from the wastewater or other waste streams until 1939 (Ref. 5, page 1; Ref. 22). From 1939 to 1947, some tar was collected for sale. No information is available on the disposition of the residual coal tar that was not sold. No record exists on the waste disposal methods used by the facility (Ref. 22, pages 1, 3 to 5, 7, 9 to 11, 13, 15 to 17, 19, 21 to 23, 25, 27 to 29, 31, 33 to 35, 37, 39 to 43, 46 to 51, 53, 56, 59 to 61, 63, 66, 68 to 70, 72, 76 to 78, 80, 83, 85 to 87, 89, 92 to 95, 97, 103 to 106, 108, 111, 113 to 115, 117, 118, 120, 121, 123, 124, 126, 127). On-site fill soils contaminated with coal tar have been found with free product DNAPL coal tar at the base of a former ravine that extends north-south across the NSP facility, indicating that some of the coal tar was disposed on site (Ref. 5, page 2). Historic drawings of record note a pipe running from the MGP north with a caption, *2” to abandoned tar dump* (Ref. 5, pages 1, 2; Ref.8, pages 2 through 5, 15, 16; Ref. 23). These drawings also depict a feature noted as a “waste tar dump” located between the seep area and the waste water treatment plant (Ref. 8, pages 2 through 8, 15, 16). Eyewitness accounts indicate that a pipe for the transportation of tar ran from the MGP to the southern portion of Kreher Park in the general location of the seep (Ref. 23, pages 1, 2).

On the NSP property, a ravine extended from south to north, emptying out at the natural shoreline to the north near the railroad tracks and the seep area. This ravine was open at the start-up of gas production and was filled by the early

1900s (Ref. 5, page ES-1, 1, 2, Figures 1-3, 1-4, and 4-1). On-site fill soils contaminated with coal tar have been found in the former ravine (Ref. 5, page 2). The fill material in the ravine also includes cinders ash, boiler slag, demolition debris, and soil (Ref. 5, pages 15, 21, 22, 58). Hazardous substances identified from samples collected from the former ravine include, but are not limited to, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)-fluoranthene, Benzo (g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Fluoranthene, Fluorene, Indeno(1,2,3 -cd)pyrene, Naphthalene, Phenanthrene, 2,6-Dimethylnaphthalene, 2-Ethylnaphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene, 1-Methylphenanthrene, Pyrene, Phenanthrene, Toluene, and Xylenes (Ref. 5, Tables 4-1 through 4-3).

The former ravine drains to the north and onto the Ashland Lakefront/Kreher Park beyond which is Chequamegon Bay (Ref. 5, page 1, 7, 8; Ref 14, page 1). Ground water in the vicinity of the former ravine moves from south to north, towards the mouth of the former ravine (Ref. 5 pages 8, 18, 23, Figures 4-8, 4-9). Just north of the ravine along the natural shoreline is a seep where water, oils, and tar flow to the land surface (Ref. 8, pages 7, 8). This seep is just north of the mouth of the former ravine and is adjacent to a bluff that transects the Ashland Lakefront Property and the NSP facility (Ref. 5, page ES-1, 2, Figure 1-2; Ref 6, page 3; Ref. 8, pages 7, 8,). This bluff runs east to west and is along the pre-fill natural shoreline of Chequamegon Bay (Ref. 5, page ES-1, 2; Ref 6, page 3; Ref. 8 page 14). Ground water in the vicinity of the ravine is contaminated with PAHs, VOCs, and NDAPL, oil, and tar (Ref. 5, page 13; Ref. 14 page 8). Contamination in soil and ground water in both the Ashland Lakefront/Kreher Park and the former ravine indicates that the former ravine may be a conduit for contamination onto the Ashland Lakefront/Kreher Park (Ref. 5, pages ES-1, 18, 22,23, Figures 1-3, 4-1; Ref. 6, pages 10, 13, 14, 18; Ref. 17, page 3-3).

Sediment contamination in Chequamegon Bay is attributed to the coal tar from the manufactured gas plant that operated on the NSP property. The possible sources attributing to contamination in Chequamegon Bay are limited to the former ravine and Ashland Lakefront/Kreher Park (Ref. 12 pages iv, 2, 4,11, 12 Table 1; Ref. 16, pages 1, 2). The vicinity of the Ashland/Northern States Power lakefront site is largely residential with commercial businesses. No other facility generating coal tar are in the vicinity of the site. Visible contamination as well as analytical samples have confirmed the presence of and releases into the environment of hazardous substances associated with the former manufactured gas plant (Ref. 3; Ref. 12, pages iv, 2, 4, 11, 12, Table 1; Ref. 8, pages 1 to 16; Ref. 16, pages 1, 2; Ref. 16, page 3).

Hazardous Substances Released

Acenaphthene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Chrysene
Ethylbenzene
Fluoranthene
Fluorene

n-Hexane
p-Isopropyltoluene
Isopropylbenzene
Naphthalene
Phenanthrene
Pyrene
2,6-Dimethylnaphthalene
2-Ethylnaphthalene
1-Methylnaphthalene
2-Methylnaphthalene
1-Methylphenanthrene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
m/p- Xylene

Surface Water Observed Release Factor Value: 550

4.1.2.1.2 Potential to Release

Because an observed release to Chequamegon Bay from the site is established by chemical analysis, potential to release was not evaluated (Ref.1, Section 4.1.2.1.2.

4.1.2.2 Drinking Water Threat Waste Characteristics

The Ashland Water Utility has a drinking water intake in Chequamegon Bay on Lake Superior. The Ashland Water Utility plant is located in the City of Ashland, Wisconsin. The intake is located 1922 feet off shore in Chequamegon Bay and is 8 feet above the lake bottom where the mean water depth is 23 feet. The Ashland Water Utility serves a population of 9115 (Ref. 21, pages 1 to 3).

4.1.2.2.1 Toxicity/Persistence

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Toxicity/ Persistence Factor Value (Table 4-12)	Reference
Acenaphthene	2	10	1	10	Ref. 2, B-1
Acenaphthylene	1, 2	---	1	---	Ref. 2, B-1
Anthracene	1, 2	10	1	10	Ref. 2, B-1
Benzene	1, 2	100	1	100	Ref 2, B-2
Benzo(a)anthracene	1, 2	1000	1	1000	Ref 2, B-2
Benzo(a)pyrene	1, 2	10,000	1	10,000	Ref. 2, B-2
Benzo(b)fluoranthene	1, 2	1000	1	1000	Ref. 2, B-3
Benzo (g,h,i)-perylene	1, 2	---	1	---	Ref. 2, B-2
Benzo(k)fluoranthene	1, 2	100	1	100	Ref. 2, B-3
n-Butylbenzene	1, 2	---	---	---	—
sec-Butylbenzene	2	---	---	---	—
Chrysene	1, 2	10	1	10	Ref.2, B-5
Ethylbenzene	1,2	10	1	10	Ref. 2, B-10
Fluoranthene	1, 2	100	1	100	Ref. 2, B-10
Fluorene	1, 2	100	1	100	Ref. 2, B-10
Indeno(1,2,3 -cd)-pyrene	1, 2	1000	1	1000	Ref. 2, B-12
Isopropylbenzene	2	---	---	---	---
p-Isopropyltoluene	2	---	---	---	---
Naphthalene	1, 2	100	1	100	Ref. 2, B-14
Phenanthrene	1, 2	---	1	----	Ref. 2, B-16
n-Propylbenzene	2	---	---	---	—
Pyrene	1, 2	100	1	100	Ref. 2, B-17
2,6-Dimethylnaphtha-					

lene	---	---	---	---	---
2-Ethylnaphtha-lene	----	---	---	---	---
1-Methylnaphtha-lene	---	---	---	---	---
2-Methylnaptha-lene	1, 2	---	1	---	Ref. 2, B-14
Toluene	1, 2	10	1	10	Ref. 2, B-19
1-Methylphenanthrene	--—	---	---	----	
1,2,4-Trimethyl-benzene	1, 2	---	---	---	----
1,3,5-Trimethyl-benzene	1, 2	---	---	---	---
Xylenes (p xylenes)	1, 2	10	1	10	Ref. 2, B-20

Notes:

* Persistence value for Great Lakes (Ref. 1, Table 4-10)

— Not available

Benzo(a)pyrene obtains a Toxicity/Persistence Value of 10,000 or 1 x 10^4.

Toxicity/Persistence Factor Value: 1 x 10^4

4.1.2.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1	Landfill	11.76
2	Landfill	>0

Sum of Values: 11.76

According to HRS Section 2.4.2.2, if any target is subject to Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because level II concentrations are documented in Chequamegon Bay, a fishery and a the habitat for a state designated endangered species, a site hazardous waste quantity factor value of 100 is assigned (HRS Section 2.4.2.2; Table 4-23; Ref. 19 and Ref. 25; HRS documentation record Sections 4.1.2.1.1, 4.1.3.3, and 4.1.4.3).

Hazardous Waste Quantity Factor Value: 100
(HRS Section 2.4.2.2)

4.1.2.2.3 Waste Characteristics Factor Category Value

Toxicity/Persistence Factor Value: 1×10^4
Hazardous Waste Quantity Factor Value: 100

Toxicity/Persistence Factor Value x
Hazardous Waste Quantity Factor Value: 1×10^6

Waste Characteristics Factor Category Value: 32
(Ref. 1, Table 2-7)

4.1.2.3 Drinking Water Threat Targets

Level I Concentrations

Level I concentrations are not scored.

Level II Concentrations

Most Distant Level II Sample:

Sample ID: AS-7
Distance from the probable point of entry: 225 feet
Reference: 10, page 7

The distance from the probable point of entry (PPE) along Chequamegon Bay to Sample AS-7 was measured using the scale provided on the sample location map in Reference 10 (Ref. 10, page 7).

4.1.2.3.1 Nearest Intake

Location of Nearest Drinking Water Intake: 1922 feet off shore in Chequamegon Bay on Lake Superior, Wisconsin
Level I/Level II/or Potential: Potential
Distance from the probable point of entry: 1922 feet

Type of Surface Water Body: Great Lake (Moderate depth)
Dilution Weight (Table 4-13): 0.00001

References: 3; 21, pages 1, 2

Nearest Intake Factor Value: 0.0002

4.1.2.3.2 Population

4.1.2.3.2.2 Level I Concentrations

Not Evaluated.

4.1.2.3.2.3 Level II Concentrations

No Evaluated.

Level II Population Factor Value: 0

4.1.2.3.2.4 Potential Contamination

Intake	Type of Surface Water Body	Assigned Dilution Weight (Table 4-13)	Population Served	References
Ashland Water Utility	Great Lake (Moderate depth)	0.00001	9115	21

Type of Surface Water Body	Total Population	Dilution-Weighted Population Value (Table 4-14)
Great Lake (Moderate depth)	9115	0.05

Sum of Distance-Weighted Population Values: 0.05
Sum of Distance-Weighted Population Values/10: 0.005

Potential Contamination Factor Value: 0.005

4.1.2.3.3 Resources

The Ashland Lakefront/Kreher Park on Chequamegon Bay is a recreational area where boating and fishing are encouraged (Ref. 12, page 2; 13; 26, pages 2, 4, 5, 6). The Ashland Water Utility has a surface water intake in Chequamegon Bay on Lake Superior within the target distance limit (Ref. 21, pages 1 to 3).

Resources Factor Value:5

4.1.3.2 Human Food Chain Threat Waste Characteristics

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Bioaccu-mulation Value**	Toxicity/ Persistence/ Bioaccumula-tion Factor Value(Table 4-16)	Reference
Acenaphthene	2	10	1	500	5000	Ref. 2, B-1
Acenaphthylene	1, 2	---	1	500	---	Ref. 2, B-1
Anthracene	1, 2	10	1	5000	50,000	Ref. 2, B-1
Benzene	1, 2	100	1	5000	500,000	Ref 2, B-2
Benzo(a)anthra-cene	1, 2	1000	1	50,000	50,000,000	Ref 2, B-2
Benzo(a)pyrene	1, 2	10,000	1	50,000	500,000,000	Ref. 2, B-2
Benzo(b)fluoran-thene	1, 2	1000	1	50,000	50,000,000	Ref. 2, B-3
Benzo (g,h,i)-perylene	1, 2	---	1	50,000	---	Ref. 2, B-2
Benzo(k)fluoran-thene	1, 2	100	1	50,000	5,000,000	Ref. 2, B-3
n-Butylbenzene	1, 2	---	---	---	—	—
sec-Butylbenzene	2	---	---	---	---	—
Chrysene	1, 2	10	1	500	5,000	Ref.2, B-5
Ethylbenzene	1,2	10	1	50	500	Ref. 2, B-10
Fluoranthene	1, 2	100	1	5000	500,000	Ref. 2, B-10
Fluorene	1, 2	100	1	5000	500,000	Ref. 2, B-10
Indeno(1,2,3 -cd)-pyrene	1, 2	1000	1	50,000	50,000,000	Ref. 2, B-12
Isopropylbenzene	2	---	---	---	---	—
p-Isopropyltoluene	2	---	---	---	---	—
Naphthalene	1, 2	100	1	500	50,000	Ref. 2, B-14
Phenanthrene	1, 2	---	1	50	---	Ref. 2, B-16
n-Propylbenzene	2					
Pyrene	1, 2	100	1	50	5000	Ref. 2, B-17
2,6-Dimethylnaphtha-lene	---	----	—	—	—	—

2-Ethylnaphthalene	----	---	—	---	—	—
1-Methylnaphthalene	---	---	----	---	—	—
2-Methylnaphthalene	1,2	---	1	5,000	---	Ref. 2, B-14
Toluene	1, 2	10	1	50	500	Ref. 2, B-19
1-Methylphenanthrene	--—	---	---	---	----	—
1,2,4-Trimethylbenzene	1, 2	---	---	---	----	—
1,3,5-Trimethylbenzene	1, 2	---	---	----	—	—
Xylenes (p xylenes)	1, 2	10	1	50	500	Ref. 2, B-20

Notes:

*	Persistence value for Great Lakes (Table 4-10)
**	Bioaccumulation factor value for Freshwater
---	Not available

Benzo(a)pyrene obtains a Toxicity/Persistence/Bioaccumulation Factor Value of 500,000,000 or 5 x 10^8.

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.3.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1	Landfill	11.76
2	Landfill	>0

Sum of Values: 11.76

According to HRS Section 2.4.2.2, if any target is subject to Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because level II concentrations are documented in Chequamegon Bay, a fishery and a the habitat for a state designated endangered species, a site hazardous waste quantity factor value of 100 is assigned (HRS Section 2.4.2.2; Table 4-23; Ref. 19 and Ref. 25; HRS documentation record Sections 4.1.2.1.1, 4.1.3.3, and 4.1.4.3).

Hazardous Waste Quantity Factor Value: 100
(HRS Section 2.4.2.2)

4.1.3.2.3 Waste Characteristics Factor Category Value

Toxicity/Persistence/Bioaccumulation Factor Value: 500,000,000
Hazardous Waste Quantity Factor Value: 100

Toxicity/Persistence x Hazardous Waste Quantity Factor Value: 1,000,000 or 1×10^6
Toxicity/Persistence x Hazardous Waste Quantity Factor Value x Bioaccumulation Factor Value: 5×10^{10}

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.3.3 Human Food Chain Threat Targets

Actual Human Food Chain Contamination

Closed Fisheries:

No closed fisheries are scored.

Level I Concentrations

Level I concentrations are not scored.

Level II Concentrations

Most Distant Level II Sample:

Sample ID: AS-7
Distance from the probable point of entry: 225 feet
Reference: 10, page 7

The distance from the probable point of entry (PPE) along Chequamegon Bay to Sample AS-7 was measured using the scale provided on the sample location map in Reference 10 (Ref. 10, page 7).

Level II Fishery:

Chequamegon Bay is a evaluated as a Level II fishery within the surface water pathway target distance limit (Refs. 10, page 7; Ref. 13, pages 1, 5; Ref. 26).

4.1.3.3.1 Food Chain Individual

Chequamegon Bay is subject to actual contamination based on observed release samples documenting hazardous substances in the fishery by chemical analysis. Several hazardous substances with a bioaccumulation potential of 500 or greater were detected in observed release sediment samples in Chequamegon Bay. Samples AS-2, AS-3, AS-4, and AS-7 all contain hazardous substances, as listed below, with a bioaccumulation potential of 50,000, the highest bioaccumulation potential in the HRS (Ref. 1, Table 4-15). A food chain individual factor value of 45 is assigned to the site score because the observed release sediment samples in Chequamegon Bay document that the fishery is subject to Level II contamination.

Sample ID: AS-2, AS-3, AS-4, AS-7

Level I/Level II/or Potential: Level II
Hazardous Substance: Benzo(a)pyrene and Indeno(1,2,3-cd)pyrene
Bioaccumulation Potential: 50,000

Identity of Fishery	Type of Surface Water	References	Dilution Weight (Ref. 1, Table 4-13)
Chequamegon Bay	Great Lake	3; 10, page 7; 13, pages 1, 5; 26	0.0001

Chequamegon Bay is on Lake Superior, one of the five Great Lakes in the United States. Samples documenting an observed release were all collected at a depth of 1.4 to 2.8 feet in Chequamegon Bay (Ref. 3; Ref. 10, pages 3 to 4, 6, 7).

Food Chain Individual Factor Value: 45

4.1.3.3.2 Population

4.1.3.3.2.1 Level I Concentrations

Identity of Fishery	Annual Production	Human Food Chain Population Value (Ref.1, Table 4-18)	References

Sum of Level I Human Food Chain Population Values:
Sum of Level I Human Food Chain Population Values x 10:

Level I Concentrations Factor Value: NS

NS Not scored

4.1.3.3.2.2 Level II Concentrations

Identity of Fishery	Annual Production (Pounds)	References	Human Food Chain Population Value (Ref. 1, Table 4-18
Chequamegon Bay	>0, but unknown	10, page 7; 13, pages 1, 5; 26	0.03

Sum of Level II Human Food Chain Population Values: 0.03

Level II Concentrations Factor Value: 0.03

4.1.3.3.2.3 Potential Human Food Chain Contamination

The potential human food chain was not scored because it would not have contributed to the overall site score.

Sum of $P_i \times D_i$: 0
(Sum of $P_i \times D_i$)/10: 0

Potential Human Food Chain Contamination Factor Value: 0

4.1.4.2 Environmental Threat Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Ecotoxicity Factor Value	Persistence Factor Value*	Bioaccu-mulation Value **	Toxicity Persistence/ Bioaccumula-Factor Value (Table 4-21)	Reference
Acenaphthene	2	10,000	1	500	5,000,000	Ref. 2, B-1
Acenaphthylene	1, 2	---	1	500	---	Ref. 2, B-1
Anthracene	1, 2	10,000	1	5000	50,000,000	Ref. 2, B-2
Benzene	1, 2	100	1	5000	500,000	Ref 2, B-2
Benzo(a)anthra-cene	1, 2	10,000	1	50,000	500,000,000	Ref 2, B-2
Benzo(a)pyrene	1, 2	10,000	1	50,000	500,000,000	Ref. 2, B-2
Benzo(b)fluoran-thene	1, 2	---	1	50,000	---	Ref. 2, B-3
Benzo (g,h,i)-perylene	1, 2	---	1	50,000	---	Ref. 2, B-2
Benzo(k)fluoran-thene	1, 2	---	1	50,000	---	Ref. 2, B-3
n-Butylbenzene	1, 2	---	---	---	—	—
sec-Butylbenzene	2	---	---	---	—	—
Chrysene	1, 2	1000	1	500	500,000	Ref.2, B-5
Ethylbenzene	1,2	100	1	50	5000	Ref. 2, B-10
Fluoranthene	1, 2	10000	1	500	5,000,000	Ref. 2, B-10
Fluorene	1, 2	1000	1	5000	5,000,000	Ref. 2, B-10
Indeno(1,2,3 -cd)-pyrene	1, 2	---	1	50,000	---	Ref. 2, B-12
Isopropylbenzene	2	---	---	---	—	—
p-Isopropyltoluene	2	---	---	---	—	—
Naphthalene	1, 2	1000	1	500	500,000	Ref. 2, B-14
Phenanthrene	1, 2	1000	1	5000	5,000,000	Ref. 2, B-16
n-Propylbenzene	2	---	---	---	---	—
Pyrene	1, 2	10,000	1	50	500,000	Ref. 2, B-17
2,6-Dimethylnaphtha-lene		---	---	---	---	—
2-Ethylnaphtha-lene		---	---	---	---	—

1-Methylnaphthalene	---	---	---	---	—	
2-Methylnaphthalene	1, 2	1000	1	5,000	5,000,000	Ref. 2, B-14
Toluene	1, 2	100	1	50	5,000	Ref. 2, B-19
1-Methylphenanthrene	---	---	---	---	—	
1,2,4-Trimethylbenzene	1, 2	---	---	---	---	—
1,3,5-Trimethylbenzene	1, 2	---	---	---	---	—
Xylenes (p xylenes)	1, 2	10	1	50	500	Ref. 2, B-20

Notes:

* Persistence value for Great Lakes (Ref. 1, Table 4-10)

** Bioaccumulation factor value for Freshwater

— Not available

Benzo(a)anthracene and Benzo(a)pyrene are assigned an Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value of 50,000,000 or 5×10^8

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2. Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1	Landfill	11.76
2	Landfill	>0

Sum of Values: 11.76

According to HRS Section 2.4.2.2, if any target is subject to Level II concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because level II concentrations are documented in Chequamegon Bay, a fishery and a the habitat for a state designated endangered species, a site hazardous waste quantity factor value of 100 is assigned (HRS Section 2.4.2.2; Table 4-23; Ref. 19 and Ref. 25; HRS documentation record Sections 4.1.2.1.1, 4.1.3.3, and 4.1.4.3).

Hazardous Waste Quantity Factor Value: 100
(HRS Section 2.4.2.2)

4.1.4.2.3. Waste Characteristics Factor Category Value

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^{8}
Hazardous Waste Quantity Factor Value: 100

Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value: 1,000,000 or 1×10^{6}

Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value x Bioaccumulation Factor Value: 5×10^{10}

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.4.3 Environmental Threat Targets

Level I Concentrations

Not evaluated.

Level II Concentrations

Most Distant Level II Sample

Sample ID: AS-7
Distance from the probable point of entry: 225 feet
Reference: 10, page 7; 19, pages 1, 2, 3, 4; 25

The distance from the probable point of entry (PPE) along Chequamegon Bay to Sample AS-7 was measured using the scale provided on the sample location map in Reference 10 (Ref. 10, page 7).

The Common Tern is listed as endangered in Wisconsin and has been designated by the U.S. Fish and Wildlife Service as a species of management concern in the Great Lakes. The Common Tern nests in Chequamegon Bay, Ashland, Wisconsin (Ref. 19, pages 1 to 4; Ref. 25; Ref 30, pages 1 to 7).

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1. Level I Concentrations

Sensitive Environments

Not evaluated

Wetlands

Not evaluated

Sum of Level I Sensitive Environments Value + Wetlands Value: 0
(Sum of Level Sensitive Environments Value + Wetlands Value)x 10: 0

Level I Concentrations Factor Value: 0

4.1.4.3.1.2. Level II Concentrations

Sensitive Environments

The Common Tern is listed as endangered in Wisconsin and has been designated by the U.S. Fish and Wildlife Service as a species of management concern in the Great Lakes. The Common Tern nests in Chequamegon Bay less than a ½ mile from the Ashland/Northern States Power Lakefront site. The site is within the habitat of the Common Tern's nesting area (Ref. 19; Ref. 25; Ref. 30).

Sensitive Environment	Distance from PPE to Nearest Sensitive Environment	References	Sensitive Environment Value (Ref. 1, Table 4-23)
Habitat known to be used by State designated endangered or threatened species	0 feet	19; 25; 30	50

Sum of Level II Sensitive Environments Value: 50

Wetlands

Not scored.

Sum of Level II Wetland Frontages: 0
Wetlands Value (Table 4-24):

Sum of Level II Sensitive Environments Value + Wetlands Value: 50
Level II Concentrations Factor Value: 50

4.1.4.3.1.3 Potential Contamination

Sensitive Environments

Not scored

Wetlands

Not scored

Potential Contamination Factor Value : 0